Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

- 20
41
=22

LIBRARY
RECEIVED
☆ APR 22 1941 ☆
U. S. Department of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics
cooperating with
NEBRASKA EXPERIMENT STATION

PLANNING FARMS FOR STABILITY IN BOONE COUNTY, NEBRASKA

By
T. S. Thorfinnson, Senior Agricultural Economist
and
Quentin H. Bierman
Bureau of Agricultural Economics

Washington, D. C.
April 1941

NOTE

The purpose of this report is to describe the existing farm economy of Boone County, to present the managerial problems confronting the farmers, and to demonstrate the possibilities of the budget method in approaching these problems. The method of analysis may be worthy of consideration in other counties where land use planning committees are dealing with similar problems.

The analysis is based upon information obtained from the records of the County Agricultural Conservation Program and survey schedules obtained from 96 successful farms for the year 1938. The information was collected under the supervision of the State B. A. E. Representative, with the cooperation of Bureau workers stationed at Lincoln the Nebraska Experiment Station the State Extension Service, and the County Agent of Boone County. The tentative draft of this report was reviewed by the State College - B. A. E. Committee at the University of Nebraska, and the County Planning Committee in Boone County. The Bureau of Agricultural Economics assumed responsibility for summarization and interpretation of these data. Members of the B. A. E. staff participating were J. L. Paschal, Raymond B. Hile, George R. Peterson, and Keith H. Spencer.

PLANNING FARMS FOR STABILITY IN BOONE COUNTY, NEBRASKA

By T. S. Thorfinnson and Quentin H. Bierman

CONTENTS

Page

The problem 1
    Reappraisal needed 3
Ninety-four percent of the farms in five areas 3
Quarter-section farm is most common 5
Cropping systems are similar 9
Successful farms larger 13
Income estimates on typical farms 17
Income increases without change in size 20
Family make-up varies income need 21
Budget assumptions 21
Supplementary tables 22

B. E. S. APR 22 1941

THE PROBLEM

The economic pressure of the last 10 years has brought distress to Nebraska farmers in the transition area between the Corn Belt and the Sand Hills. Typical of this area is Boone County in which grasshoppers, drought, and low prices have wrought havoc during recent years. The Corn Belt economy in the rougher areas of this county has not stood the test of these difficulties. Current thought regarding the trends in agriculture in the county gives rise to the following questions:

What systems of farming are best adapted to the soils and the climate? Can the Corn Belt type of agriculture continue or must farmers adopt a less intensive system of farming? What changes in systems of farming will be required if the percentage of cropland on rough topography is reduced to the extent recommended by the County Planning Committee? Are the incomes on some of the smaller farms inadequate to support the families that occupy them? If so, must the acreage in these farms be increased or can other ways of increasing the income be found? Do farms that have been successfully operated in the past provide a pattern for the rest, or are the successful farms also in need of adjustment to meet changing conditions? Can Boone County farmers devise new systems of farming that will fit future conditions better than do present systems? Under the new systems (if they are developed), can agriculture provide adequate support for all the people now living in Boone County?

These and related questions seem important to the future well-being of agriculture in Boone County and the larger transition area of which it is a part. The objective of this report is to throw some light upon these questions, though adequate (and final) answers are not yet available. Following are some of the facts revealed by the study.

Only a few farms are located in the sandy soil area in northwestern Boone County. In the rest of the county, a Corn Belt type of farming predominates. The principal sources of income are corn, hogs, and cattle. The cropping system varies little with changes in soil, topography, or size of farm. The percentage of cropland in the level areas exceeds that on the rough land. However, observations of the County Planning Committee indicate that too much of the rough land is plowed.

Operating units vary in size from quarter-section farms in the areas of good soil, to large ranches in the sandy area. Approximately half the farms in the county are quarter-sections. Some tendency toward smaller farms on the bottom lands along streams and toward larger farms in the areas of rough topography is noted, but these differences are not so great as might be expected.

Incomes too small for family.- Approximately two-fifths of the farms in the county are smaller than the sizes considered satisfactory by the County Planning Committee. In other words, between 600 and 700 farms may need more land, or some alternative adjustment, in order that the income may be sufficient to support an average farm family. Budget estimates of income expectancy on farms of 160, 240, and 320 acres, seem to verify the recommendations of the County Planning Committee regarding the size of farm required to support an average farm family in areas of good soil and level to gently rolling topography. 1/ The experience of successful farmers also supports these recommendations.

Drastic changes in size and type of farm will be required in the areas of rough topography 2/ if the percentage of cropland is reduced to the extent recommended by the County Planning Committee. A more extensive type of agriculture with more emphasis upon pasture and cattle may displace the present Corn Belt type in which hogs and corn receive major emphasis.

The significance of the problems in Boone County becomes apparent if it is assumed that equally drastic changes may be required throughout the entire transition area (comprising approximately eight counties, 3,000,000 acres, or 12,000 farms). Can these changes be made or must agriculture in this area be content with compromises? How much change may be expected in the light of alternative opportunities for farmers?

1/ This refers to Areas I, II, and III, which contain 80 percent of the farms in the county.

2/ This refers particularly to Areas IIIa and IV, in which are found 14 percent of the farms in the county.

Reappraisal of Measures is Needed

The magnitude of this problem revealed suggests a reappraisal of the measures thus far used in determining the adjustments. Possibly this reappraisal should precede the development of an active adjustment program. Groups of farmers engaged in planning may wish to classify the land in Boone County according to its use capability. They may also wish to develop farming systems suitable to the land as classified, as well as estimates of the income expectancy of these systems based upon expected yields and prices. Differences in the managerial capacity of the operator, differences in size of family, and a host of other factors, should probably enter into this appraisal. If more land is not available to farmers whose holdings are too small, consideration might be given to alternative changes which would increase the farm income.

NINETY-FOUR PERCENT OF THE FARMS IN FIVE AREAS

The nine land use areas in Boone County, as indicated by the County Planning Committee, are shown in figure 1. The relative importance of each area from the standpoint of size is roughly evident. The number of farms in each area and the proportion of the county total which these represent is another measure of significance of the various areas. Fifty-nine percent of the farms in the county are located in Area III; 17 percent in Area I; 8 percent in Area IV; 6 percent in Area IIIa; and 4 percent in Area II. Ninety-four percent of the farms in the county are located in the five areas listed. Areas Va, VI, V, and Ia are relatively insignificant in terms of the number of farms (table 1). Areas I, II, and III, comprising 80 percent of the farms in the county, are so closely associated geographically that they may possibly be considered as one area with regard to sizes and types of farms.

Table 1.- Distribution of farms in various land use areas, Boone County, Nebraska, 1938

Areas	Farms		
	Number	Percent	Cumulative Pct.
III	885	59	59
I	256	17	76
IV	124	8	84
IIIa	87	6	90
II	61	4	94
Va	31	2	96
VI	29	2	98
V	10	1	99
Ia	7	1	100
Total	1/ 1,490	100	-

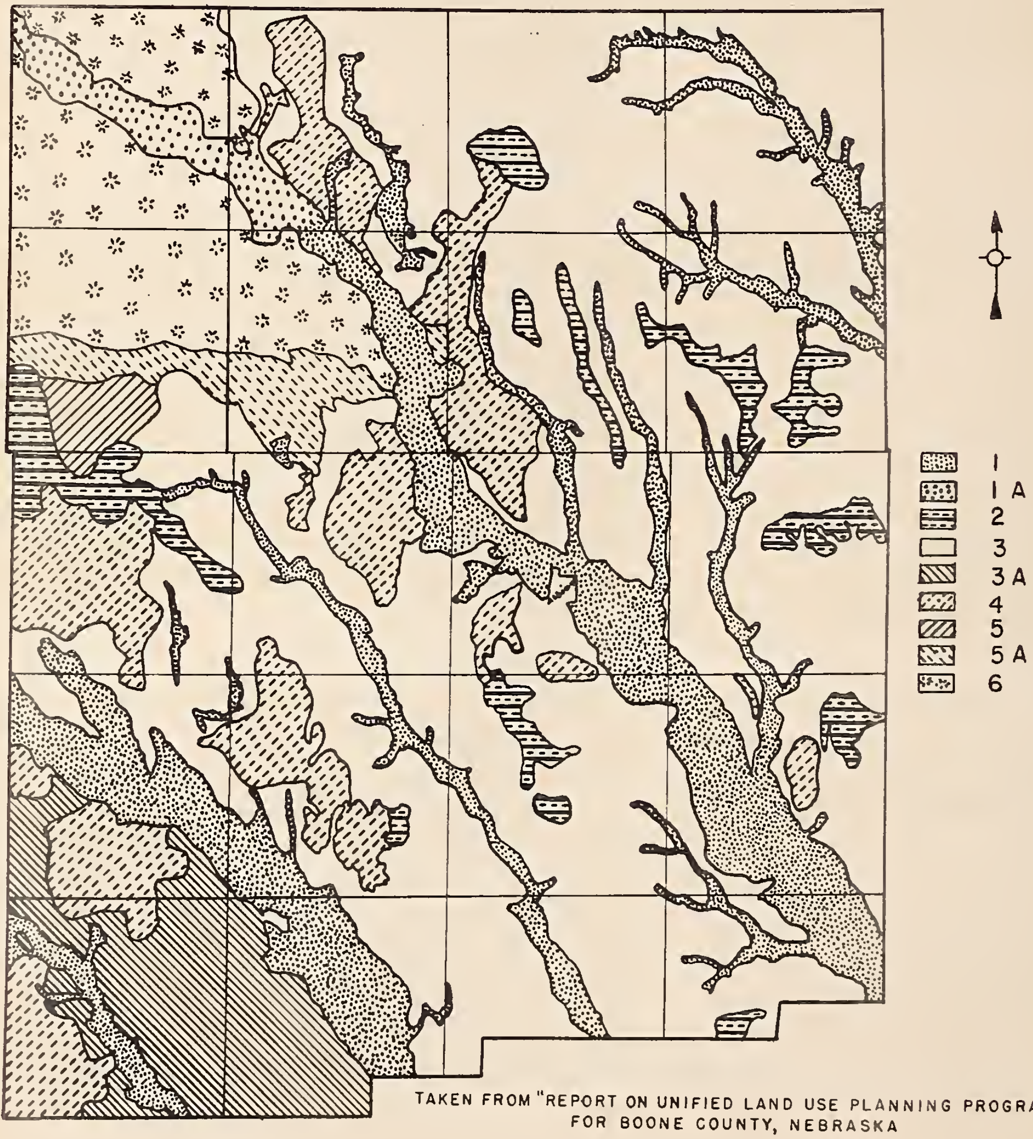
1/ Includes operating units lying 50 percent or more within each area designated. Ninety-nine operating units were so divided between areas that they were not 50 percent within any one area.

Agricultural Conservation Program records.

FIG. I LAND USE AREAS

BOONE COUNTY

NEBRASKA



TAKEN FROM "REPORT ON UNIFIED LAND USE PLANNING PROGRAM" FOR BOONE COUNTY, NEBRASKA

U. S. DEPARTMENT OF AGRICULTURE NEG. 38907 BUREAU OF AGRICULTURAL ECONOMICS

QUARTER-SECTION FARM IS MOST COMMON

Quarter-section farms outnumber all other sizes. Fifty-five percent of the farms are 219 acres or smaller. Most of these are quarter sections (table 2). Fifteen percent of the farms approximate 240 acres and 16 percent are approximately 320 acres in size. Apparently 160-, 240-, and 320-acre farms characterize roughly the size array in the county, extremes omitted. The size array in Area III fits the pattern of the county as a whole. Sizes of farms are fairly comparable in Areas IIIa and IV, and in Areas II and III, although there are minor differences. The greatest concentration of farms smaller than a quarter section is found in Area I. Farms larger than 300 acres are relatively scarce in this area. Distribution of farms by size in the four principal areas is shown graphically in figure 2.

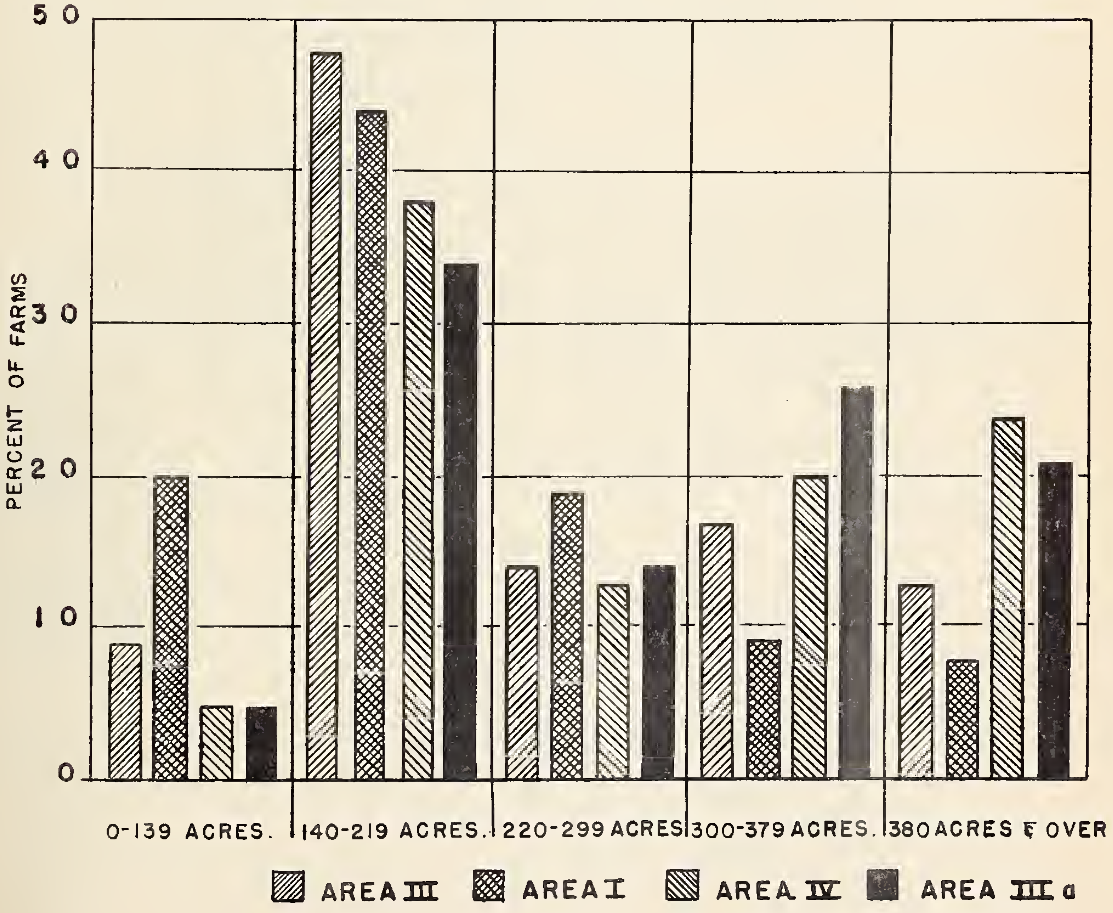
The scatter of the different sizes of farms over the county (fig. 3) shows some tendency for concentration of larger units in the sandy areas in the northwestern part of the county and some tendency for predominance of small farms in the bottom lands and near the principal towns. However, large farms and small farms are intermingled throughout most of the county with the exception of the sand hills. Relatively small farms predominate in all of the principal land use areas but farms tend to be larger on rough topography (Areas IIIa and IV), and smaller on the more level lands (Areas I, II, and III). Yet this difference in size is not so great as the soil and topographic conditions would seem to warrant. This further emphasizes a problem already recognized by the County Planning Committee, namely, that sizes of farm are not adjusted to differences in soil and topography in the various parts of the county.

Table 2.- Distribution of farms, by size, in the land use areas of Boone County, Nebraska, 1938

Size (acres)	Areas																		County total	
	III		I		IV		IIIa		II		Va		VI		V		Ia			
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
0 - 139	83	9	52	20	6	5	4	5	3	5									148	10
140 - 219	427	48	113	44	47	38	30	34	29	47	14	45	1	3	5	50	1	14	667	45
220 - 299	127	14	48	19	16	13	12	14	10	16	2	6	2	7	1	10	1	14	219	15
300 - 379	137	16	22	9	25	20	23	26	15	25	9	29	1	3	3	30	3	43	238	16
380 - Over	111	13	21	8	30	24	18	21	4	7	6	20	25	87	1	10	2	29	218	14
Total	885	100	256	100	124	100	87	100	61	100	31	100	29	100	10	100	7	100	1,490	100

Agricultural Conservation Program records.

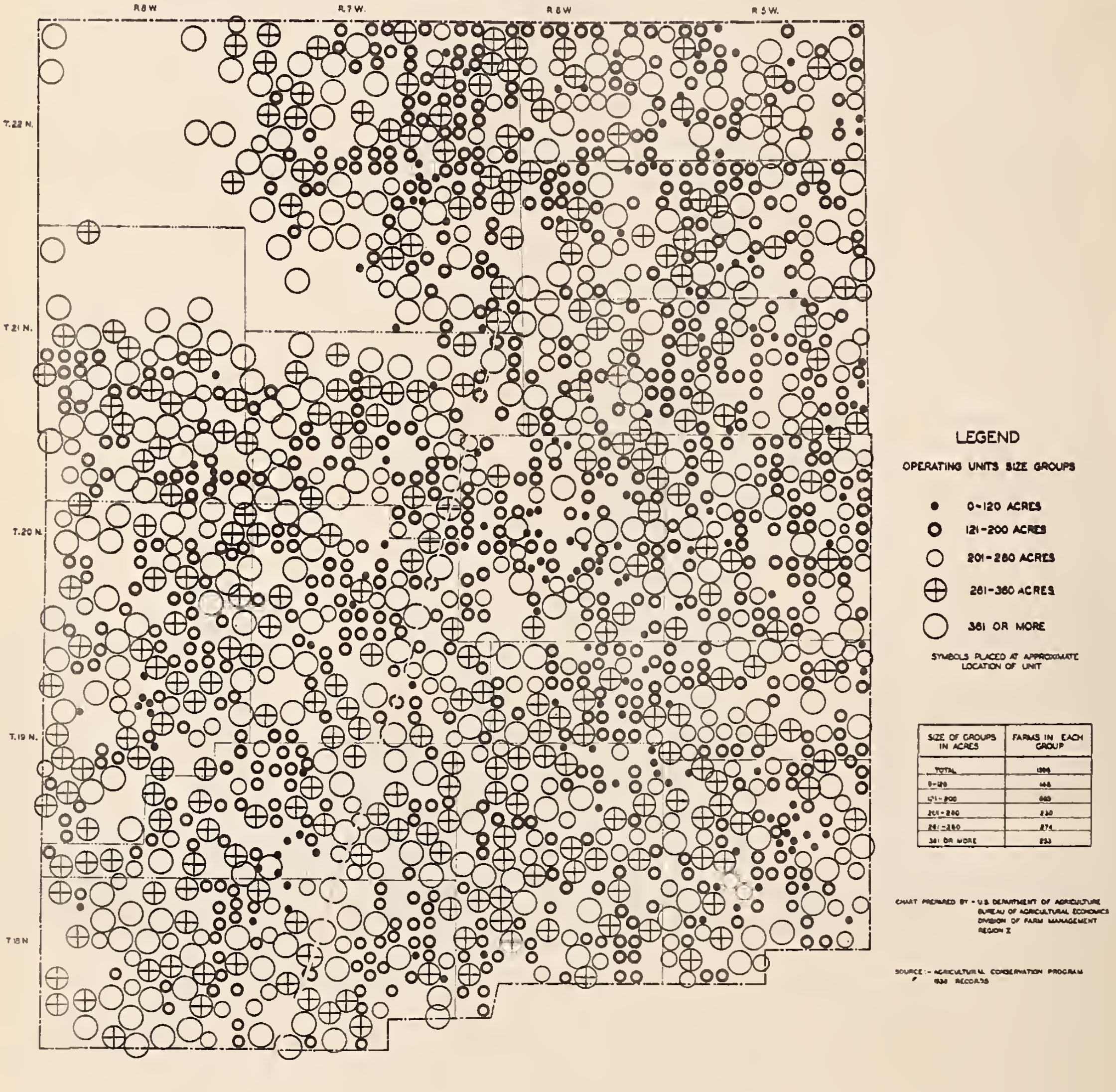
FIG.2. DISTRIBUTION OF FARMS BY SIZE IN FOUR PRINCIPAL SOIL AREAS, BOONE COUNTY, NEBRASKA, 1938.



(SOURCE: ACP RECORDS)

U. S. DEPARTMENT OF AGRICULTURE NEG. 38908 BUREAU OF AGRICULTURAL ECONOMICS

FIG. 3. RELATIVE SIZE AND LOCATION OF OPERATING UNITS
BOONE COUNTY, NEBRASKA
1938



SYMBOLS PLACED AT APPROXIMATE LOCATION OF UNIT

SIZE OF GROUPS IN ACRES	FARMS IN EACH GROUP
TOTAL	[illegible]
0-120	148
121-200	663
201-280	230
281-360	274
361 OR MORE	253

CHART PREPARED BY - U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
DIVISION OF FARM MANAGEMENT
REGION I

SOURCE:- AGRICULTURAL CONSERVATION PROGRAM
1938 RECORDS

U.S. DEPARTMENT OF AGRICULTURE

NEG. 38909 BUREAU OF AGRICULTURAL ECONOMICS

CROPPING SYSTEMS ARE SIMILAR

Cropping systems of farms as operated in the principal soil areas of the county are fairly similar, regardless of the size of farm and the use-capability of the soil. 3/ This indicates that the cropping systems have not been adapted to the variations in soil, topography, and size of the farm unit.

Approximately two-thirds of the cropland is in corn and feed grains combined, one-tenth is in annual forage crops, and a slightly smaller percentage in legumes. Corn alone occupies from 40 to 50 percent of the cropland.

The similarity of cropping systems in the principal land use areas is indicated by the fact that the proportion of cropland planted to row crops varies only from 44 percent in Area IV to 52 percent in Area I; feed grains from 18 percent in Area I to 22 percent in Area III; and legumes from 7 percent in Area I to 11 percent in Area IIIa (table 3 and fig. 4).

Table 3.- Percentage of cropland in principal crops in four areas in Boone County, Nebraska, 1938
(Based on average of all farms in each area)

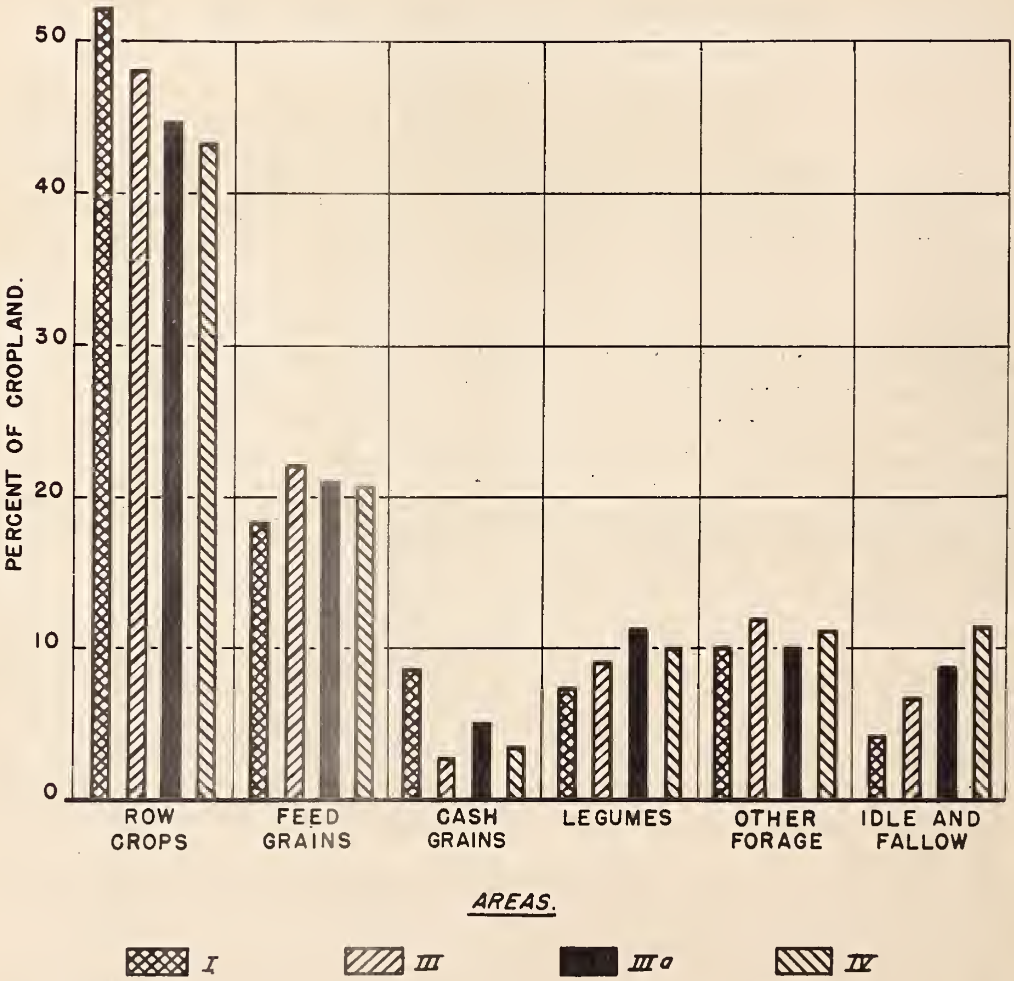
Kind of crop	Area			
	III	I	IV	IIIa
	Percent	Percent	Percent	Percent
Row crops	48.0	52.0	44.0	45.7
Feed grains	22.2	18.2	20.6	20.6
Cash grains	2.9	8.6	3.5	4.8
Legumes	8.8	7.1	9.9	10.6
Other forage crops	11.6	10.1	10.8	9.7
Idle and fallow land	6.5	4.0	11.2	8.6
Total cultivated land	100.0	100.0	100.0	100.0

Agricultural Conservation Program records.

3/ Cropping system, as used here, denotes the proportion of the cropland planted to each of the principal crops. It describes the use of the cropland, but it does not take account of the differences in the proportion of the land which is in cultivation, as against the proportion in grass and wasteland. Uses of cropland were divided into six groups, as follows:
(1) Row crops (corn, grain sorghums, potatoes, and truck crops).
(2) Feed grains (oats and barley).
(3) Cash grains (wheat and rye).
(4) Legumes (alfalfa and sweetclover).
(5) Other forage crops (forage sorghums, rotation pasture, other forage, and any other crops of minor importance).
(6) Idle and fallow land.

FIG. 4.

PERCENTAGE OF CROPLAND IN PRINCIPAL CROPS IN FOUR AREAS IN BOONE COUNTY, 1938.



BASED ON AVERAGE OF ALL FARMS IN EACH AREA, A.C.P. RECORDS.

U. S. DEPARTMENT OF AGRICULTURE   NEG. 38861 BUREAU OF AGRICULTURAL ECONOMICS

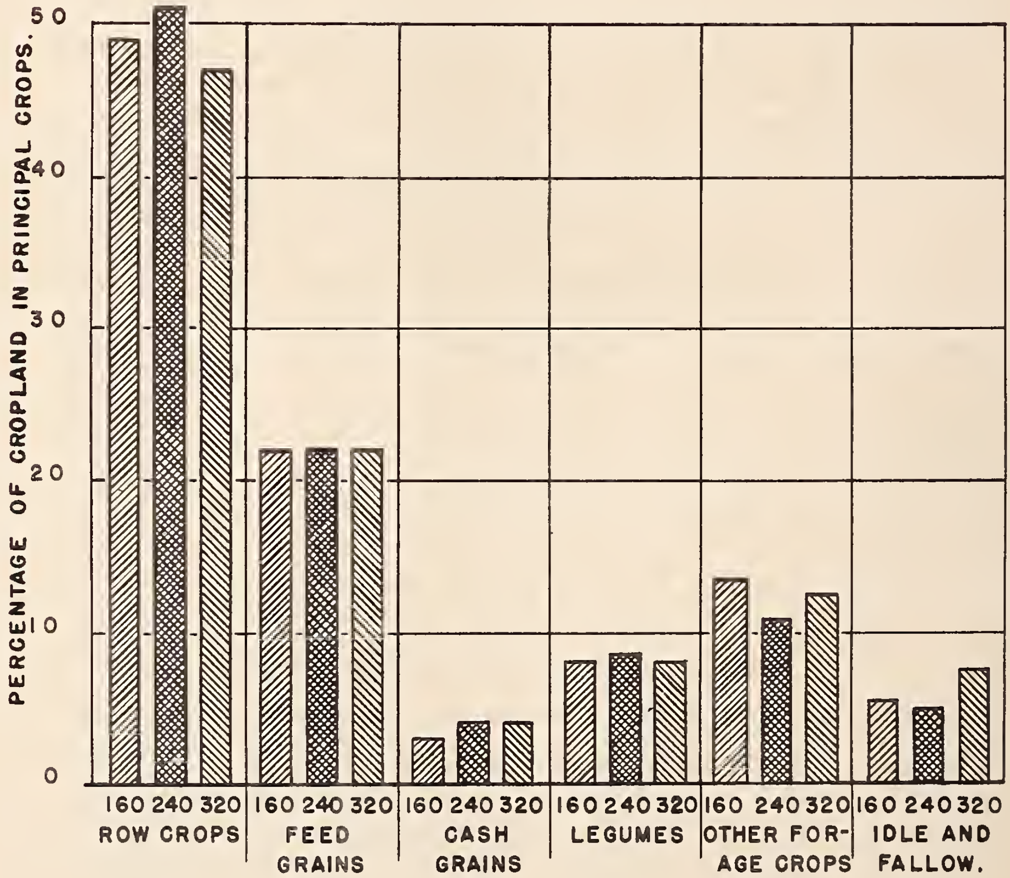
The variation in cropping systems on different sizes of farm in the five principal land use areas is very minor. The proportion of cropland planted to corn varies from 45 percent on the larger farms to 58 percent on the farms of 100 acres or less; feed grains from 16 percent on small farms to 22 percent on large farms; and legumes from 7 percent on small farms to 11 percent on large farms (table 4 and fig. 5). A similar comparison is shown for Areas I, III, IIIa, and IV in tables 11, 12, 13, and 14. The minor differences in cropping systems on farms of different sizes include a tendency toward greater emphasis of cash grains on large farms and greater emphasis on row crops on small farms in Areas I and IIIa. These and other differences observed are relatively minor.

Table 4.- Percentage of cropland in principal crops in five areas combined, Boone County, Nebraska, 1938
(Based on average of all farms by size groups)

Kind of crop	Size of farm (acres)						
	61-100	101-120	121-200	201-280	281-360	361-440	441-520
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Row crops	57.8	51.6	49.0	50.8	47.4	45.5	45.2
Feed grains	15.9	23.1	22.0	21.8	21.5	22.1	21.5
Cash grains	2.5	1.4	2.9	3.8	3.8	3.7	3.7
Legumes	6.7	8.8	7.8	8.4	8.3	10.3	11.3
Other forage crops	11.4	12.6	12.9	10.4	11.4	10.3	9.8
Idle or fallow .	5.7	2.5	5.4	4.8	7.6	8.1	8.5
Total cultivated land	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Agricultural Conservation Program records, Areas I, II, III, IIIa, and IV.

FIG.5. PERCENTAGE OF CROPLAND IN PRINCIPAL CROPS ON THREE SIZES OF FARMS, BOONE COUNTY, NEBRASKA. 1938.*



(SOURCE: A.C.P. RECORDS IN AREAS I, II, III, IIIa, & IV.)

**BASED ON AVERAGE OF ALL FARMS IN EACH OF THREE PRINCIPAL SIZE GROUPS.*

U. S. DEPARTMENT OF AGRICULTURE NEG. 38910 BUREAU OF AGRICULTURAL ECONOMICS

SUCCESSFUL FARMS LARGER [4]

Successful farms tend to be larger than other farms in the county (table 5 and fig. 6). In the sample taken only 2.4 percent of the successful farms comprised 120 acres or less, compared with 10 percent of all farms in the principal soil areas. Likewise, only 31 percent of the successful farms were in the quarter-section groups, while 45 percent of the entire group of farms were of this size. Conversely, successful farms were more frequently found in the larger size groups.

Table 5.- Distribution of successful farms by size, as compared with all farms in the principal land use areas, Boone County, Nebraska, 1938 [1]

Size groups (acres)	Successful farms in Areas I, II, III, and IV			All farms in Areas I, II, III, IIIa, and IV		
	Number	Percent	Cumulative percent	Number	Percent	Cumulative percent
0 - 100	1	1.2	1.2	107	7.6	7.6
101 - 120	1	1.2	2.4	32	2.3	9.9
121 - 200	27	31.4	33.8	636	45.0	54.9
201 - 280	17	19.8	53.6	216	15.3	70.2
281 - 360	12	13.9	67.5	231	16.3	86.5
361 - 440	10	11.6	79.1	60	4.2	90.7
441 - 520	7	8.1	87.2	68	4.8	95.5
521 and over	11	12.8	100.0	63	4.5	100.0
Total	86	100.0		1,413	100.0	

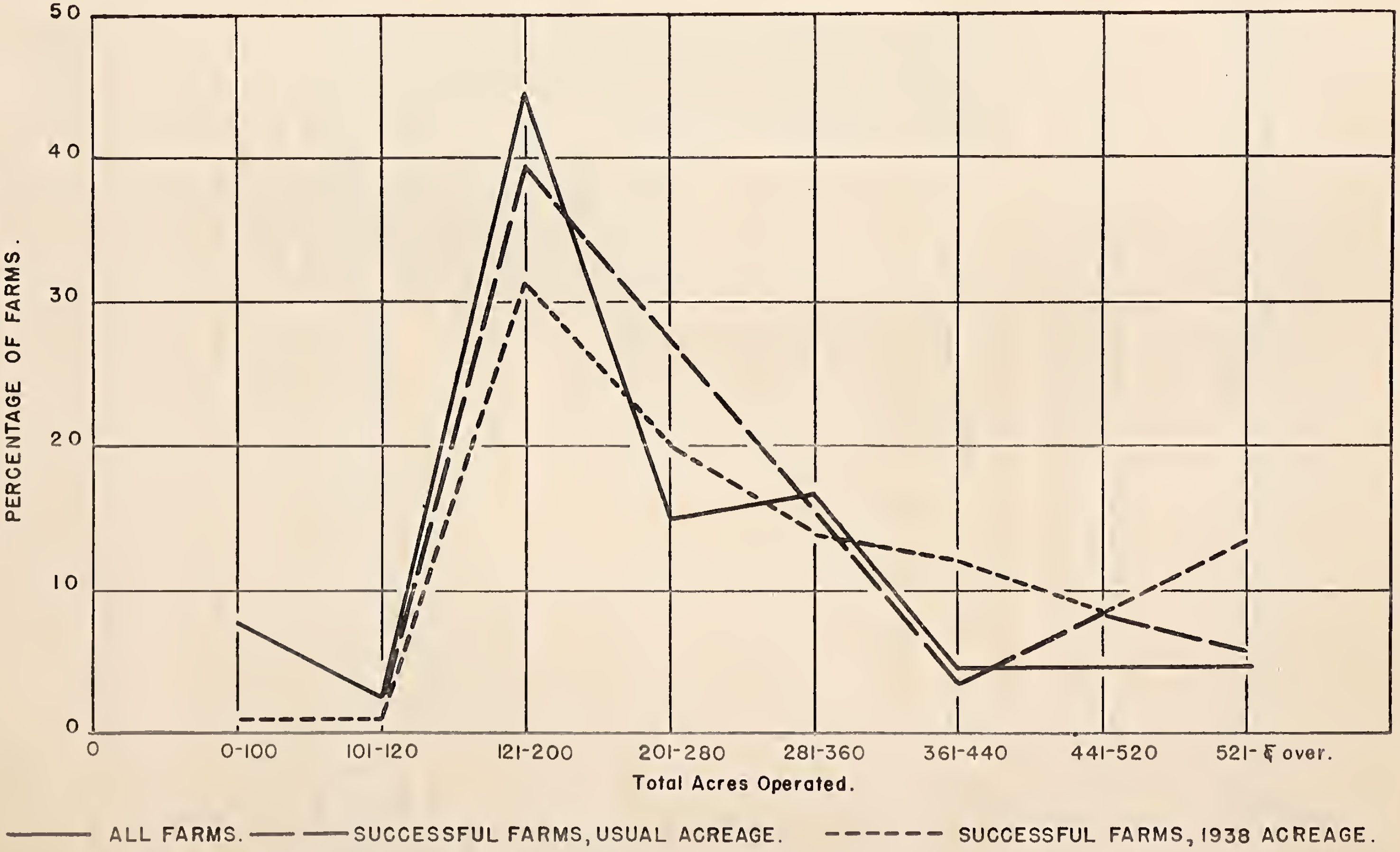
[1] Areas I, II, III, IIIa, and IV, include 94 percent of the farms in the county. Most of the schedules obtained from successful farms were from Areas I, II, III, and IV.

Some tendency for these successful farms to become larger is indicated by comparison of the acreage operated in 1938 with the acreage normally operated (table 10). In 1938, 62 percent of these farmers were operating the same acreage that they normally operated; 10 percent had reduced their acreage; and 28 percent had increased the acreage in their farms.

---

[4] These farmers were successful in terms of having established a good credit rating, being financially solvent, and being recognized as good substantial citizens in their respective communities. The county agent, local bankers, and local merchants were consulted in selecting these farmers. The group surveyed may be considered a sample of the successful farms in the county. It does not include all of the successful farms.

FIG. 6. SIZE DISTRIBUTION OF SUCCESSFUL FARMS COMPARED WITH ALL FARMS IN AREAS I, II, III, IIIa, & IV COMBINED.* BOONE COUNTY, NEBRASKA. 1938.



* THERE WERE NO SUCCESSFUL FARM SCHEDULES FROM AREA IIIa.

U. S. DEPARTMENT OF AGRICULTURE NEG. 38911 BUREAU OF AGRICULTURAL ECONOMICS

The cropping systems on successful farms were very similar, regardless of size of farm. They differed slightly from cropping systems on other farms in the county. For example, the proportion of legumes and row crops was greater on the successful farms (table 6 and fig. 7).

The average number of livestock usually kept on the successful farms exceeded somewhat the numbers on the average farm in the county (tables 16 and 17).

Table 6.- Percentage of cropland in principal crops, by three sizes of farm, for average and successful farms, Boone County, Nebraska, 1938 1/

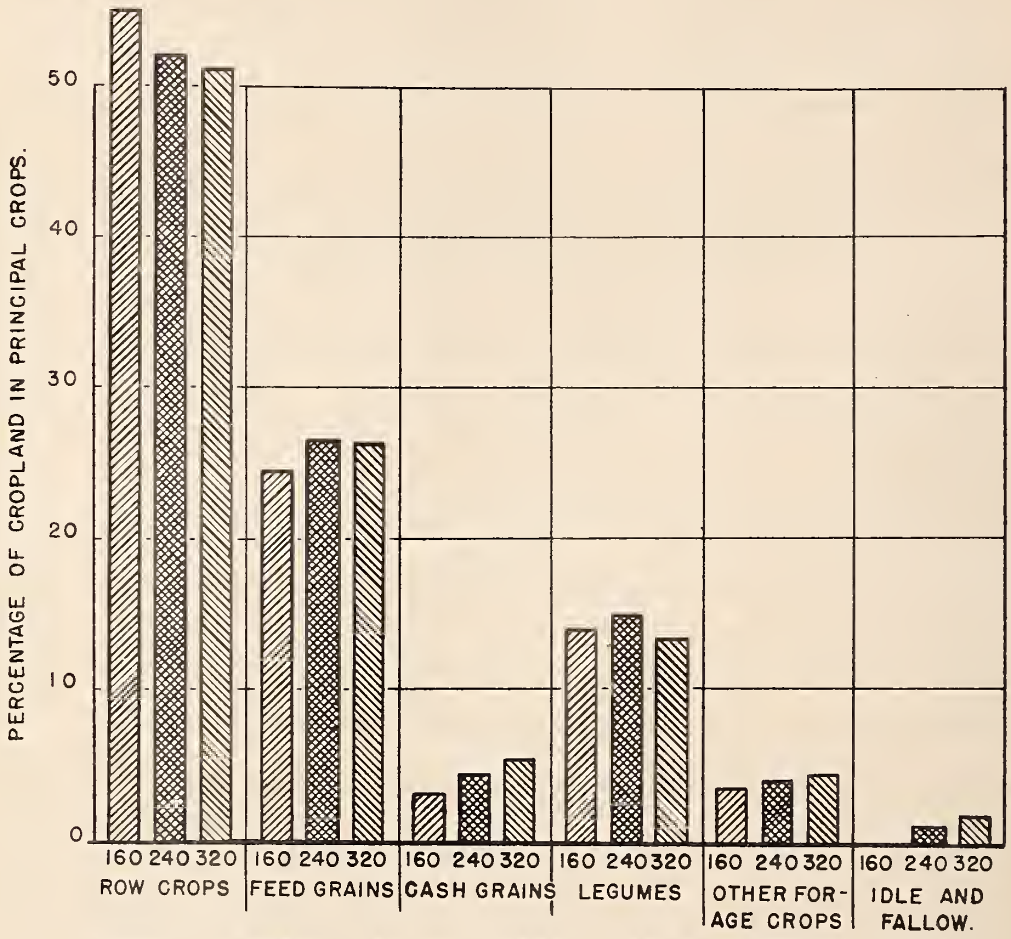
Kind of crop	160 acres		240 acres		320 acres	
	Average	Successful	Average	Successful	Average	Successful
	Percent	Percent	Percent	Percent	Percent	Percent
Row crops	49	55	51	51	47	51
Feed grains	22	24	22	24	22	24
Cash grains	3	3	4	5	4	5
Legumes	8	14	8	15	8	14
Other forage crops	13	4	10	4	11	5
Idle and fallow	5	0	5	1	8	1
Total	100	100	100	100	100	100

1/ Includes five areas: I, II, III, IIIa, and IV.

Agricultural Conservation Program records and schedules of successful farms.

FIG. 7.

PERCENTAGE OF CROPLAND USUALLY PLANTED TO PRINCIPAL CROPS ON THREE SIZES OF SUCCESSFUL FARMS, BOONE COUNTY, NEBRASKA.



BASED ON SURVEY OF 71 SUCCESSFUL FARMS IN AREAS I, II, III & IV.

U. S. DEPARTMENT OF AGRICULTURE NEG. 38912 BUREAU OF AGRICULTURAL ECONOMICS

INCOME ESTIMATES ON TYPICAL FARMS

The County Planning Committee recommended a 10 percent reduction in cropland in the county as a whole (table 7). No reduction was recommended on the bottom lands in Area I, but a reduction of 19 to 25 percent was recommended on the rough land (Areas IIIa and IV). The size of farm recommended varied from 160 acres in Area I to 400 acres in Area IV.

Table 7.- Size of farm and percentage of tillage recommended by the Boone County Planning Committee for the principal land use areas in the county 1/

Area	Recommended size of farm	Land cultivated: Present practice: 1938	Land cultivated: Recommended
	Acres	Percent	Percent
I	160	70	71
II	200	84	80
III	200	84	75
IIIa	320	75	50
IV	400	54	35

1/ From the report of Boone County Planning Committee, entitled "Planning for Better Land Use, 1939."

To test the practicability of these recommendations, income estimates were prepared for farms of 160-, 240-, and 320-acres (table 8). Assuming that a family cash income of $400 per year is required, farms of 240 and 320 acres would provide fairly satisfactory incomes when 79 to 85 percent of the farm area is cultivated. When all expenses, including interest on the owner's equity, are accounted for, the income from the quarter-section farm is very low. With only 50 percent of the land under cultivation, the income appears to be inadequate on all the sizes under consideration, unless interest on the owner's equity is used to pay family living expenses. When only 35 percent of the farm area is cultivated none of these sizes appears to be satisfactory. It is difficult to visualize continuation of a Corn Belt type of agriculture in areas where only 35 percent of the land is suitable for cultivation.

Apparently these estimates of income support the County Planning Committee's recommendations for size of farm in Areas II and III. But, a farm of 320 acres in Area IIIa (with 50 percent of the land cultivated) may be inadequate. Likewise, a farm of 400 acres may be too small in

Table 8.- Estimated average income per farm on three typical sizes of farm in Boone County, Nebraska, under varying percentage of tillage and varying intensities of livestock production

Item	160-acre farm			240-acre farm			320-acre farm		
	Income above cash farm expense 1/	Income above cash farm expense & depreciation	Income above cash expense, depreciation & interest on owner's equity	Income above cash farm expense 1/	Income above cash farm expense & depreciation	Income above cash expense, depreciation & interest on owner's equity	Income above cash farm expense 1/	Income above cash farm expense & depreciation	Income above cash expense, depreciation & interest on owner's equity
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
79-84 percent tilled									
1. Some corn sold	508	278	-2	954	699	277	1,257	972	398
2. All feed fed	597	367	59	1,013	758	336	1,322	1,037	463
3. Additional feed bought	714	484	204	1,262	1,007	585	1,585	1,300	726
50 percent tilled									
1. Some corn sold				-	-	-	615	330	-102
2. All feed fed				549	294	-52	657	372	-61
3. Additional feed bought	389	159	-114	662	407	48	847	562	118
35 percent tilled									
1. Some corn sold	-	-	-	-	-	-	-	-	-
2. All feed fed	-	-	-	153	-102	-395	-	-	-
3. Additional feed bought	-	-	-	293	38	-271	469	204	-165

1/ Includes interest on borrowed capital at 6 percent.

Area IV. A farm of 160 acres may be rather small in Area I, unless the land is considerably more productive than the average in the county. 5/

Further examination of the estimates of income on the 160-acre farm seems warranted, in view of the fact that approximately half the farms in the county are now this size. Following are the amounts remaining to cover cash cost of family living on a 160-acre farm, based on three different assumptions.

(1)	Income above cash farm expenses	$597
(2)	Income above cash farm expenses and depreciation	$367
(3)	Income above cash farm expenses, depreciation, and interest on owner's equity	$ 59

On the basis of the income remaining after all expenses have been paid (including interest on the operator's equity of 50 percent) (income 3) this farm would not adequately support a family. 6/ If the interest on the owner's equity is used for living expenses, however, the balance left for family living seems reasonably adequate (income 2). This basis might be considered sound in case the operator had a 50 percent equity in the farm business. (This equity would amount to about $7,700.) If the operator used, for living expenses, the interest due him on his equity, he would add nothing to his estate, but he could continue on a solvent basis owning half interest in the land, buildings, machinery, and livestock. During occasional years of crop failure or low prices, the income above cash expenses might be used for family living (income 1). This is based on the assumption that depreciation costs can be delayed for several years. Ultimately, of course, depreciation must be paid, for equipment must be replaced when it wears out.

The three measures of income just described are based upon the assumption that all the feed raised is fed to livestock on the farm rather than sold on the market. If it is assumed that some additional feed is bought and that the calves raised are sold as baby beeves (850 pounds), the income remaining for family living on the quarter-section farm would be increased by $100 to $150 yearly (table 8).

The estimates of income used above are based on average yields and average prices. Under actual conditions, yields and prices change from year to year. Incomes vary accordingly. A few of the incomes which might result from varying yields and prices are indicated in table 9. Apparently

---

5/ Since yields were not available by land use areas the income estimates do not reflect the effect of varying productivity in these areas. However, it seems reasonable to assume that yields in areas having good soil and level topography (such as Areas I and II) would exceed the yields in poor soil areas (such as Areas IIIa and IV).

6/ The yield of corn used in these calculations (24 bu. per acre) and the resulting income ($59) appear to be too low to justify a land value of $60 per acre. If yields and income are representative, then some reduction in land value will probably occur. This adjustment will decrease costs and increase the balance remaining for family living.

the cash balances left for family living on the 160-acre farm would be satisfactory whenever yields and prices, or both, are above the average.

Table 9.- Estimated income per farm on a 160-acre farm in Boone County, Nebraska, with varying yields and prices, assuming 80 percent of the farm area is cultivated and that some feed is purchased to fatten livestock 1/

Item	Income 2/	Income 3/	Income 4/
	Dollars	Dollars	Dollars
Average yields and average prices	714	484	204
Low yields and high prices	1,033	803	523
High yields and average prices	1,111	881	601
Average yields and high prices	1,554	1,324	1,044
High yields and high prices	2,193	1,963	1,683

1/ Only the variations which result in incomes above the average have been indicated, as the average income was no more than adequate for family support.
2/ Income above cash expenses (includes, as expense, the interest on one-half of the investment, at 6 percent).
3/ Income above cash farm expenses and depreciation.
4/ Income above cash farm expenses, depreciation, and interest on the owner's equity, at 4 percent.

INCOME INCREASES WITHOUT CHANGE IN SIZE

In case the income of a 160-acre farm in Boone County is considered somewhat inadequate for family needs, the size of the business may be increased and the income level may be raised somewhat by increasing the size and the quality of some of the livestock enterprises. For example, some farm families may find it profitable to increase the size of the poultry flock moderately and improve the quality of the hens. In other cases, it may be possible to improve the quality of the milk cows, so that 175 to 200 pounds of butterfat may be expected per cow, instead of 150 pounds which was used in the above budget calculations. Some farmers may find it profitable to cater to special local markets for high quality fryers, fresh eggs, and similar products. A good farm garden will help to lower the cash costs of the family living.

If Government assistance for needy cases continues, loans at a low rate of interest would lower the costs and increase income balances on small farms. For example, if the full amount of the farm investment on a 160-acre farm were loaned at 3 percent, the interest charge on an investment of $15,440 would amount to $463, compared with $772 at 5 percent. The difference between these two interest charges is $309 a year. The saving in interest charges would increase materially the balance left for family living.

FAMILY MAKE-UP VARIES INCOME NEED

Living expenses vary considerably with the size of the family and its age status. Thus, bachelors and aged couples who have no children can live on less than can families that have several growing children. These factors must be given consideration in appraising the adequacy of various income levels. Any given income level may be adequate for one family and inadequate for another.

In many instances, operators of small farms have opportunity for employment outside the farm, either in a nearby town or on neighboring farms. These opportunities also must be considered in appraising the adequacy of the income of small farms.

BUDGET ASSUMPTIONS

The budget calculations, results of which are given in table 8, represent the average income of 160-, 240-, and 320-acre farms, based on average yields in Boone County and approximately average farm prices in Nebraska. One group of budgets indicates the income for these sizes of farms, when 79 to 84 percent of the total farm area is under cultivation. Another group of budgets indicates the income when only 50 percent of the land is cultivated, and a third group shows the returns under 35-percent cultivation.

In each of these groups three assumptions were made regarding the crops grown: (1) that some corn was sold for cash; (2) that all the feed raised was fed to livestock on the farm; and (3) that supplemental feed was purchased in order to enlarge the livestock enterprises.

Three different income residuals are used throughout these budgets. The first shows the balance left for family living when all cash farm expenses (including interest at 6 percent on half the total investment) are deducted from the gross income (table 8). The second shows the balance left for family living when all cash farm expense and depreciation on machinery and buildings are deducted from the gross farm income. The third residual shows the balance left for family living when all cash farm expenses, depreciation, and interest on the owner's equity in the farm investment, are deducted from the gross farm income.

In the first instance, the assumption is that the farm family uses, for living expenses, the interest on the owner's equity and money which should be set aside for depreciation, as well as the return for their labor. Such a condition might exist during periods of distress, although, in the long run, it is not sound from a strictly business standpoint.

In the second instance, the assumption is that the farmer is able to set aside depreciation reserves, but that he is willing to use interest on his equity as part of the family living expense. In the third instance, it is assumed that all farm expenses (both cash and noncash) are paid and that the farm is on a sound business basis from the long-time standpoint.

Yields and prices used in the budget calculations are indicated in table 19. The farm expenses are roughly based upon expenses reported by the successful farms from which survey schedules were obtained in 1938.

The summaries of the detailed budgets of the 160-, 240-, and 320-acre farms provide a rough idea of the method of calculation used. These calculations are based on the assumption that all feed raised was fed to livestock on the farm.

SUPPLEMENTARY TABLES

Table 10.- Distribution of successful farms, by size groups, in Areas I, II, III, and IV, on the basis of acreage operated per farm in 1938 and acreage usually operated, 86 farms, Boone County, Nebraska

Size (acres)	Farms					
	Classification based on acreage usually operated			Classification based on acreage operated in 1938		
	Number	Percent	Cumulative percent	Number	Percent	Cumulative percent
0 - 100	0	0	0	1	1.2	0
101 - 120	1	1.2	1.2	1	1.2	2.4
121 - 200	34	39.5	40.7	27	31.4	33.8
201 - 280	23	26.8	67.5	17	19.8	53.6
281 - 360	13	15.1	82.6	12	13.9	67.5
361 - 440	3	3.5	86.1	10	11.6	79.1
441 - 520	7	8.1	94.2	7	8.1	87.2
521 - Over	5	5.8	100.0	11	12.8	100.0
Total	86	100.0	-	86	100.0	-

Schedules from successful farms.

Table 11.- Percentage of cropland in principal crops, by size of farm, in Area I, Boone County, Nebraska, 1938
(Based on average of all farms in each size group)

Item	Size of farm (acres)					
	120 and less	121-200	201-280	281-360	361 and over	All farms
Number of farms	51	106	50	28	21	256
Kind of crop	Percent	Percent	Percent	Percent	Percent	Percent
Row crops	60.5	53.4	55.4	47.8	47.1	52.0
Feed grains	13.2	19.1	20.5	18.5	15.6	18.2
Cash grains	4.1	5.6	7.7	11.3	13.5	8.6
Legumes	7.0	7.8	6.0	7.2	6.9	7.1
Other forage crops	12.1	11.7	8.4	10.7	8.9	10.1
Idle and fallow land	3.1	2.4	2.0	4.5	8.0	4.0
Total cultivated land	100.0	100.0	100.0	100.0	100.0	100.0

Agricultural Conservation Program records.

Table 12.- Percentage of cropland in principal crops, by size of farm, in Area III, Boone County, Nebraska, 1938
(Based on average of all farms in each size group)

Item	Size of farm (acres)							
	120 & less	121-200	201-280	281-360	361-440	441-520	521 & over	All farms
Number of farms	78	422	130	139	45	47	24	885
Kind of crop	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Row crops	55.8	48.0	49.9	47.4	46.7	44.7	48.9	48.0
Feed grains	19.6	22.6	22.1	22.8	22.4	21.8	21.3	22.2
Cash grains	.7	2.1	2.9	2.8	3.1	2.9	7.3	2.9
Legumes	7.9	8.1	8.7	7.9	10.4	11.6	8.7	8.8
Other forage crops	11.9	13.3	10.7	12.0	10.0	9.9	7.6	11.6
Idle and fallow land	4.1	5.9	5.7	7.1	7.4	9.1	6.2	6.5
Total cultivated land	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Agricultural Conservation Program records.

Table 13.- Percentage of cropland in principal crops, by size of farm, in Area IIIa, Boone County, Nebraska, 1938
(Based on average of all farms in each size group)

Item	Size of farm (acres)				
	0 - 200	201 - 280	281 - 360	361 and over	All farms
Number of farms	34	11	24	18	87
Kind of crop	Percent	Percent	Percent	Percent	Percent
Row crops	47.7	47.9	47.1	42.8	45.7
Feed grains	22.4	20.0	21.0	19.1	20.6
Cash grains	3.7	2.3	2.9	8.0	4.8
Legumes	7.9	18.6	11.2	9.4	10.6
Other forage crops	11.6	5.8	9.8	9.5	9.7
Idle and fallow land	6.7	5.4	8.0	11.2	8.6
Total cultivated land	100.0	100.0	100.0	100.0	100.0

Agricultural Conservation Program records.

Tablr 14.- Percentage of cropland in principal crops, by size of farm, in Area IV, Boone County, Nebraska, 1938
(Based on average of all farms in each size group)

Item	Size of farm (acres)			
	0 - 240	241 - 399	400 & over	All farms
Number of farms	55	40	29	124
Kind of crop	Percent	Percent	Percent	Percent
Row crops	45.5	46.3	41.1	44.0
Feed grains	21.2	19.9	20.6	20.6
Cash grains	3.7	2.8	4.1	3.5
Legumes	8.6	9.4	11.0	9.9
Other forage crops	13.5	11.3	9.2	10.8
Idle and fallow land	7.5	10.3	14.0	11.2
Total cultivated land	100.0	100.0	100.0	100.0

Agricultural Conservation Program records.

Table 15.- Acreages normally planted to the principal crops on 71 successful farms in Boone County, Nebraska

Item	120 - 200 acre farms			201 - 280 acre farms			281 - 360 acre farms		
	Acres planted	Percent of acres operated	Percent of acres culti-vated	Acres planted	Percent of acres operated	Percent of acres culti-vated	Acres planted	Percent of acres operated	Percent of acres culti-vated
Number of farms	34			23			14		
Kind of crop	Acres	Percent	Percent	Acres	Percent	Percent	Acres	Percent	Percent
Row crops	71	43	55	101	42	51	130	40	51
Feed grains	30	19	24	48	20	24	62	19	24
Cash grains	4	3	3	9	4	5	14	4	5
Legumes	18	11	14	30	12	15	34	10	14
Other forage crops ..	6	3	4	9	4	4	12	4	5
Idle and fallow land.	-	-	-	1		1	3	1	1
Total cultivated land	129	79	100	198	82	100	255	78	100
Wild hay	4	2		4	2		17	5	
Permanent pasture ...	20	12		26	11		42	13	
Roads, etc.	12	7		13	5		13	4	
Total acres operated.	165	100		241	100		327	100	

Successful schedules.

Table 16.- Average livestock numbers per farm, Boone County, Nebraska

Kind of livestock	Number of livestock per farm			
	1930 census	1938 A.C.P.	1938 schedules 1/	Normal schedules 1/
	Average	Average	Average	Average
Work stock	5.1	3.5	4.7	7.1
Milk cows	5.1	3.4	5.8	7.8
Beef cows	1.9	1.1	4.1	5.9
Other cattle	13.4	3.8	16.2	42.1
Ewes	1.0		2.6	4.4
Lambs			2.5	4.3
All sheep	1.0	.3	5.1	8.7
Sows	10.0		5.2	16.7
Pigs raised	22.6		33.5	105.0
All pigs	32.6	3.0	38.7	121.7
Chickens	96.0	28.0	82.0	139.0

1/ From 96 successful schedules taken in Boone County, Nebraska, 1938.

Table 17.- Numbers of livestock normally kept per farm on 71 successful farms in three size groups, Boone County, Nebraska

Kind of livestock	Number of head per farm on farms of:		
	121-200 acres	201-280 acres	281-360 acres
	Number	Number	Number
Work stock	5	6	10
Milk cows	7	8	9
Beef cows	3	3	9
Calves	9	9	14
Other cattle	2	-	3
Cattle fed	17	26	25
Sows	15	17	19
Pigs	93	112	109
Hens	104	180	158
Number of farms	34	23	14

Successful schedules.

Table 18.- Livestock production, yields of crops, and prices of products used in calculating budgets, Boone County, Nebraska

Kind of crop and livestock	Unit	Production (per acre or per head)	Farm price per unit
			Dollars
Corn	Bushel	24	.56
Oats	do.	27	-
Barley	do.	25	-
Alfalfa	Ton	1.6	8.00
Long yearlings	Pound	850	.08
Feeders	do.	600	.06
Calves	do.	400	.06½
Sows	do.	350	.04
Pigs	do.	200	.07
Cull cows	Head	xx	25.00
Number of pigs per litter	do.	5½	
Number of eggs per hen	Dozen	7	.15
Butterfat per cow	Pound	150	.25
Poultry meat	do.	xx	.12

Bur. of Agr. Economics and Nebraska Expt. Station.

Table 19.- Variable yields and prices used in budget calculations basic to table 9 1/

Kind of crop or livestock	Unit	Production			Farm price per unit		
		Low	Average	High	Low	Average	High
					Dollars	Dollars	Dollars
Corn	Bushel	20	24	30	.32	.56	.80
Oats	do.	20	27	35	.15	.25	.35
Barley	do.	18	25	33	.25	.40	.55
Alfalfa	Ton	1.3	1.6	2.0	5.00	8.00	11.00
Yearlings	Cwt.				4.50	8.00	11.25
Feeders	do.				4.00	6.00	8.00
Calves	do.				4.00	6.50	8.00
Sows	do.				2.00	4.00	6.00
Hogs	do.				4.00	7.00	10.00
Cull cows	Head				15.00	25.00	35.00
Eggs	Dozen				.10	.15	.25
Butterfat	Pound				.15	.25	.35
Poultry meat	do.				.10	.12	.15

1/ For average production of livestock and livestock products see table 18.

Table 20.- Estimated average annual income and expenses on a 160-acre farm, Boone County, Nebraska

Item	PRODUCTION AND SALES						EXPENSES	
	Acres	Yield	Production	Amount sold	Price	Value	Kind	Amount
Land use	No.	Bu. or ton	Bu. or ton	Bu. or ton	Dols.	Dols.	Cash expense and interest	Dols.
Corn	71	24	1,704				Twine	12.00
Oats	15	27	405				Threshing	35.00
Barley	15	25	375				Corn shelling	15.00
Alfalfa	25	1.6 T.	40 T.				Feed bought	90.00
Temp. pasture	5						Seed bought	10.00
Total cropland	131						Ins. buildings	15.00
Perm. pasture	18						Taxes - Real Est.	90.00
Roads & waste	11						" - Personal	20.00
Total	160						Med. & Vet. fees	20.00
	Number	Production		Amount sold	Price	Value	Baby chicks	12.00
							Bldg. repairs	50.00
							Mach. repairs	40.00
Livestock	No.			Lbs. & dozen	Dols.	Dols.	Automobile (farm use)	50.00
Work horses	4							
Milk cows	8	1,200# butterfat		900	.25	225.00	Miscellaneous	75.00
		1 cull sold			25.00	25.00	Interest	463.00
Heifers:							Total cash expense	997.00
2 yrs. old	1							
1 yr. old	1							
Long yearling	6	stockers @ 600#		3,000	.06	180.00	Noncash expense	
Calves	7						Depreciation:	
Sows	14	14 sold @ 350#		4,900	.04	196.00	Automobile	50.00
Spr. litters	14	5½ per litter		12,200	.07	854.00	Machinery	90.00
Hens	100	50 hens sold		150	.12	18.00	Buildings	90.00
		25 cockerels sold		50	.12	6.00		
Chicks	100							
Eggs		7 doz. per hen		600	.15	90.00		
		Total livestock income				1,594.00		
		Total gross income				1,594.00	Total noncash expense	230.00

INVESTMENT

Land, 160 acres @ $60	$ 9,600
Buildings	3,175
Machinery 1/	1,500
Livestock	1,165
	$15,440

SUMMARY

Total gross income		$1,594.00
Cash expenses	$ 997.00	
Income I		597.00
Depreciation	230.00	
Income II		367.00
Int. on operator's equity @ 4%	308.00	
Income III		59.00

1/ Machinery item includes automobile.

Table 21.- Estimated average annual income and expenses on a 240-acre farm, Boone County, Nebraska

Item	PRODUCTION AND SALES						EXPENSES	
	Acres	Yield	Production	Amount sold	Price	Value	Kind	Amount
Land use	No.	Bu. or ton	Bu. or ton	Bu. or ton	Dols.	Dols.	Cash expense and interest	Dols.
Corn	100	24	2,400				Twine	20.00
Oats	40	27	1,080				Threshing	55.00
Barley	20	25	500				Corn shelling	20.00
Alfalfa	25	1.6 T.	40 T.				Feed grinding	
Annual hay	0						Feed bought	205.00
Temp. pasture	17						Seed bought	10.00
Total cropland	202						Ins. on bldgs.	18.00
Perm. pasture	16						Taxes - Real Est.	135.00
Roads & waste	22						- Personal	25.00
Total	240						Hired labor	75.00
	Number	Production		Amount sold	Price	Value	Med. & Vet. fees	30.00
							Baby chicks	20.00
				Lbs. or			Bldg. repairs	60.00
Livestock	No.			dozen	Dols.	Dols.	Mach. repairs	50.00
Work horses	6						Auto expense	
Milk cows	10	150# B.F. per cow		1,200#	.25	300.00	(farm use)	50.00
Beef cows	0	2 cull milk cows					Miscellaneous	100.00
		sold			25.00	50.00	Interest	633.00
Heifers:							Total cash	
2 yrs. old	2						expense	1,506.00
1 yr. old	2							
Long yearlings	7	6 sold @ 850#		5,100#	.08	408.00	Noncash expense	
Calves	9						Depreciation:	
Bull	0						Automobile	50.00
Sows	20	20 sold @ 350#		7,000#	.04	280.00	Tractor	
Spring litter	20	5½ pigs per					Machinery	100.00
		litter		17,600#	.07	1,232.00	Buildings	105.00
Hens	200	sells 100 hens		300#	.12	36.00		
		" 75 cockerels		150#	.12	18.00		
Eggs		7 doz. per hen		1,300 dz.	.15	195.00		
Chicks	200							
		Total livestock income				2,519.00	Total noncash	
		Total gross income				2,519.00	expense	255.00

INVESTMENT	
Land, 240 acres @ $60	$ 14,400
Buildings	3,525
Machinery 1/	1,500
Livestock	1,680
	$ 21,105

SUMMARY		
Total gross income		$ 2,519.00
Cash expenses	$ 1,506.00	
Income I		1,013.00
Depreciation	255.00	
Income II		758.00
Int. on owner's equity @ 4%	422.00	
Income III		336.00

1/ Machinery item includes automobile.

Table 22.- Estimated average annual income and expenses on a 320-acre farm, Boone County, Nebraska

Item	PRODUCTION AND SALES						EXPENSES	
	Acres	Yield	Production	Amount sold	Price	Value	Kind	Amount
Land use	No.	Bu. or ton	Bu. or ton	Bu. or ton	Dols.	Dols.	Cash expense and interest	Dols.
Corn	135	24	3,240				Twine	25.00
Oats	48	27	1,296				Threshing	75.00
Barley	20	25	500				Corn shelling	30.00
Alfalfa	35	1.6 T.	56 T.				Feed bought	157.00
Annual hay	7	1.6 T.	11.2 T.				Seed bought	15.00
Temp. pasture	10						Ins. on bldgs.	25.00
Total cropland	255						Taxes - Real Est.	180.00
Perm. pasture	50						- Personal	30.00
Roads & waste	15						Hired labor	150.00
Total	320						Med. & vet. fees	40.00
	Number	Production		Amount sold	Price	Value	Baby chicks	20.00
							Bldg. repairs	70.00
Livestock	No.			Lbs. or dozen	Dols.	Dols.	Mach. repairs	60.00
Work horses	8						Auto expense (farm use)	75.00
Milk cows	10	150# B.F. per cow		1,200#	.25	300.00	Misc. expense	125.00
Beef cows	8	3 cull cows sold			25.00	75.00	Interest	861.00
Heifers:							Total cash expense	1,938.00
2 yrs. old	3							
1 yr. old	3							
Long yearlings	13	12 sold @ 850#		10,200#	.08	816.00	Noncash expense	
Calves	16						Depreciation:	
Bull	1						Automobile	50.00
Sows	24	24 sold @ 350#		8,400#	.04	336.00	Tractor	
Spring litters	24	5½ pigs per litter		21,200#	.07	1,484.00	Machinery	120.00
							Buildings	115.00
Hens	200	Sells 100 hens		300#	.12	36.00		
		" 75 cockerels		150#	.12	18.00		
Chicks	200							
Eggs		7 doz. per hen		1,300 dz.	.15	195.00		
		Total livestock income				3,260.00	Total noncash expense	285.00
		Total gross income				3,260.00		

INVESTMENT

Item	Amount
Land, 320 acres @ $60	$ 19,200
Buildings	3,875
Machinery 1/	1,700
Livestock	3,935
	$ 28,710

SUMMARY

Item		
Total gross income		$3,260.00
Cash expenses	$1,938.00	
Income I		1,322.00
Depreciation	285.00	
Income II		1,037.00
Int. on owner's equity @ 4%	574.00	
Income III		463.00

1/ Machinery item includes automobile.

b